possible to get very good outcomes in Department of Veterans Affairs hospitals.

There is not a lot that is surprising here. Operative mortality was lower with endovascular repair and long-term mortality was no different, reflecting previous studies. However, secondary intervention rates were similar in the open vs endovascular repair groups. This difference from previous studies likely reflects a more conservative approach to treatment of type II endoleaks as well as the inclusion of non-graft-related procedures (ie, incisional hernia repairs) in the open cohort. Erectile dysfunction and quality of life were similar in the two groups at 2 years, likely reflecting similar underlying levels of comorbidity. An important factor not addressed in this study is relative overall cost of the two procedures.

Projected Cancer Risks from Computed Tomographic Scans Performed in the United States in 2007

Berrington de Gonzalez A, Mahesh M, Kim K-P, et al. Arch Intern Med 2009;169:2071-7.

Conclusion: Use of computed tomography (CT) scans contributes significantly to future total cancer risk.

Summary: Ideally, determining cancer risk from CT scans would entail a large-scale study with life-long follow-up. This is impractical, and alternatively, risk assessment can be obtained using risk projection models. In the early 1990s, the authors used such models and estimated 0.2% of incident cancers in the United Kingdom were attributable to CT scans (Lancet 2004;363:345-55). CT use in the United States is now 10 times higher than in the early 1990s, and thus, incident cancers related to CT scanning maybe as high as 1.5% to 2% (N Engl J Med 2007;357:2277-84). Estimates of the current frequency of CT scan use by CT scan type (Health Phys 2008;95: 502-7) combined with radiation risk models based on the National Research Council's "Biologic Effects of Ionizing Radiation" report (BEIR VIII—Phase 2, National Academics Press, Washington, DC, 2005), was used in this study to estimate future cancer risks from CT scans performed in 2007. The goal was to provide an evaluation of the public health effect of CT-induced cancers and to determine which age groups and scan types were associated with the highest risk. Monte Carlo Simulation was used to estimate the median number of radiation-related incident cancers with 95% uncertainty limits (UL).

The authors estimated approximately 29,000 (95% UL, 15,000-45,000) future cancers will be related to CT scans performed in 2007 in the United States. Scans of the abdomen and pelvis, chest, and head, and chest CT angiography, will be the largest contributors to new cancers (n = 14,000, 95% UL 6900-25,000 for abdomen and pelvis; n = 41,000, 95% UL 1900-8100 from chest scans; n = 4000, 95% UL 1100-8700 for head scans; and n = 2,700, 95% UL 1,300-5,000 for CT angiography). According to the model, 33% of projected cancers will be from scans performed at ages of 35 to 54 years, 15% will be due to scans performed at age <18, and 66% of projected cancers will be in women.

Comment: Assuming, as the authors do, a 50% mortality rate from the CT-induced cancers, the study suggests about 15,000 people will die as a direct result of CT scans performed in 2007 alone. This article and that by Smith-Berdman et al, also featured in this Abstract Section of the JVS, together indicate that there is more radiation from CT scans and more danger attributable to that radiation than has been previously recognized. That this will apparently result in many thousands of excess cancers and many thousands of excess deaths is sobering. The knee-jerk response of "just get a CT" should be a thing of the past.

Radiation Dose Associated with Common Computed Tomography Examinations and the Associated Lifetime Attributable Risk of Cancer

Smith-Bindman R, Lipson J, Marcus R, et al. Arch Intern Med 2009;169: 2078-86.

Conclusion: Radiation doses from diagnostic CT examinations are higher and more variable then often quoted.

Summary: In 2007 nearly 70 million CT examinations were performed in the United States (J Am Coll Radiol 2007;4:272-84). Although a highly important advance in medical care, CT scans deliver very high doses of radiation compared with conventional diagnostic x-ray imaging. Increased speed of image acquisition is also associated with higher radiation doses. Epidemiologic data from survivors of atomic bomb explosions and patients living near nuclear facilities during the accidental release of radioactive materials, such as Chernobyl, has allowed calculation of long-term health risk from radiation exposure (BEIR VII—Phase 2, National Academies Press, Washington, DC, 2006). Surprisingly, a single CT scan can deliver an equivalent radiation exposure to that some individuals received from the explosion of the Hiroshima and Nagasaki atomic bombs (Health Physics 2008;95:502-7). In this study, the authors aimed to estimate the radiation exposure associated with commonly performed CT examinations, to estimate variation in radiation dose across patients and institutions and type of CT scan, and to estimate a lifetime attributable risk of cancer associated with these examinations.

In this retrospective cross-sectional study, the authors described radiation doses associated with the 11 most common types of diagnostic CT scans performed on 1119 consecutive adult patients at four San Francisco Bay area institutions. The study took place between January 1 and May 30, 2008. From the measured doses from the CT scans, they estimated the lifetime cancer risk attributable to CT scans.

There were considerable differences in radiation dosage between different types of CT scans. Overall, the median effective dose ranged from 2 mSv for a routine head CT scan to 31 mSv for a multiphase abdominal and pelvis CT scan. The effective dose varied widely across and within institutions. There was a mean 13-fold variation between the highest and lowest dose for each study type. The number of CT scans estimated to lead to the development of cancer varied widely depending on the patient's age, sex, and type of CT examination. They estimate that cancer attributable to the CT scan will develop in 1 in 270 women who undergo a CT coronary angiogram at age 40 years and in 1 in 600 men. A routine head CT scan performed at 40 years of age would produce 1 cancer in 8100 women and 1 cancer in 11,080 men. The risk approximately doubled for 20-year-old patients and was approximately 50% lower for 60-year-old patients.

Comment: One of the most disconcerting aspects of this report is that the actual delivered doses of radiation with CT scans were significantly higher than commonly quoted. The median dose of a multiphase abdominal and pelvis CT scan was nearly 400% higher than what is often quoted. There was also a dramatic variation of effective dose between institutions and between studies. A particular concern was the age and sex effects of varying radiation dosage. On the basis of the highest effective dose observed in this study, a 20-year-old woman undergoing a CT scan for suspected pulmonary embolism where a multiphase pelvis abdomen CT scan was also used could have an associated risk of cancer as high as 1 in 80! The study highlights many challenges for continued used of diagnostic CT scanning. Efforts must be made to minimize radiation exposure from CT by reducing unnecessary studies, reducing radiation dose per study, and reducing the variations in radiation dose across facilities and patients. (See also the abstract by Berrington de Gonzalez et al in this Abstract Section of the JVS).

Screening for Abdominal Aortic Aneurysm with Electronic Clinical Reminders

Padberg FT, Hauck K, Mercer RG, et al. Am J Surg 2009;198:670-4.

Conclusion: An electronic medical record (EMR) system can be used to provide automatic clinical reminders for patients identified as benefitting from abdominal aortic aneurysm (AAA) screening.

Summary: Population-based studies have determined that a single ultrasound examination in men aged between 65 and 75 years who have ever smoked is cost-effective in identifying AAAs and facilitating elective repair before rupture. There is a relative risk reduction for deaths from AAA of 43% associated with screening protocols (Ann Intern Med 2005;142:198-202). The rapidly increasing implementation of EMR systems raises the possibility of having automatic reminders to remind health care providers about patients whose profile indicates a benefit of screening for AAA.

The authors used the computerized patient record system (CPRS) of their Veterans Affairs hospital to implement automatic electronic reminders for AAA screening in patients who had been determined to benefit from AAA screening. They assessed the ability of their age-prompted clinical reminder to facilitate detection of AAA. AAA risk screening was installed in May 2007 in their CPRS to prompt health care providers of male veterans, ages 65-70, who had ever smoked to order a screening examination for AAA in these patients. Screening consisted of an abbreviated ultrasound examination of the abdominal aorta using anterior-posterior and transverse plains. The largest infrarenal aortic diameter was reported. They performed 1437 screening examinations and found 73 AAAs ≥3 cm (5.1%), 33 AAAs >4 cm (2.3%), 15 AAAs >5 cm (1.0%), and 11 AAAs greater >5.5 cm (0.77%). Of the patients found to have AAAs, 68% received counseling for abnormal findings.

Comment: EMR systems are becoming the standard. Certainly, the Obama Administration has made the implementation of EMR systems one of the cornerstones of its health care reform package. This report makes it clear such a system can facilitate appropriate screening for patients at risk for AAA. To make such a system most effective, an order for screening should be required for the physician to move forward in the EMR system or the physician would have to justify why screening was not ordered for that particular at-risk patient.

Screening Men for Abdominal Aortic Aneurysm: 10 Year Mortality and Cost Effectiveness Results from the Randomised Multicentre Aneurysm Screening Study

Thompson SG, Gao L, Scott RAP, and the Multicentre Aneurysm Screening Study Group. BMJ 2009;338:b2307 (doi:10.1136/bmj.b2307).

Conclusion: The mortality benefit of screening men aged 65 to 74 years for abdominal aortic aneurysm (AAA) is maintained up to 10 years after